

SECTION 4

AVIATION FORECASTS

This section presents the forecasts of aviation activity for Cochise College Airport. These projections represent the future traffic levels to be accommodated at the airport, and for which facilities should be provided. The forecast developed for this study covers the period between 2001 and 2020. Intermediate year forecasts are also provided for 2005 and 2010. Thus, the forecasts serve as the basis for determining the phased development of facility improvements for the short, intermediate and long-range planning periods.

The forecast analysis includes projections of:

- Total based general aviation aircraft by type (single engine piston and multi-engine piston).
- Total annual aircraft operations by type of operation (local versus itinerant).
- Aircraft operations in the peak hour.
- Annual aviation gas flowage.

There has been no scheduled passenger service or cargo activity at the airport in the past, and none is anticipated during the planning period.

Due to uncertainties in the aviation industry and student populations, long-term forecasting of activity for the College's aviation program is approximate in nature. However, the forecasts described here were developed using the best available information and will serve the useful function of providing guidance on future aviation facility needs.

NATIONWIDE TRENDS IN GENERAL AVIATION GROWTH

The number of general aviation aircraft based in the nation is forecast by the FAA to grow from 184.3 million in 1999 to 218.8 million by 2020, an average annual increase of 0.8 percent (Table 4-1).

As described in FAA's FAA Aerospace Forecasts, Fiscal Years 2000 - 2011, March 2000, "of major importance to the general aviation community are the positive statistics regarding student pilots. The number of active student pilots increased for a third consecutive year in 1999 (up 4.4 percent), totaling an estimated 102,000. In addition, preliminary estimates show that the FAA processed a total of 47,091 student pilot certificates (both new and renewals) during the first 8 months of 1999, a 12.6 percent increase over 1998. Preliminary estimates also show that the FAA issued 39,963 original student pilot certificates during the first 8 months of 1999, an

increase of 16.9 percent over the same 1998 time period.” The FAA estimates the number of student pilots will increase to 148,800 in 2010, an average growth rate of 3.5 percent a year from 1999 to 2010 (Table 4-2).

Table 4-1
FAA FORECAST OF ACTIVE GENERAL AVIATION
AIRCRAFT IN THE U.S.

| | Aircraft (Thousands) | | | |
|----------|-----------------------------|----------------|-------------------|--------------|
| | Fixed Wing | | Helicopter | Total |
| | Piston | Turbine | | |
| 1994 [a] | 142.2 | 8.0 | 4.7 | 154.9 |
| 1995 [a] | 152.8 | 9.6 | 5.8 | 168.2 |
| 1996 [a] | 153.6 | 10.1 | 6.6 | 170.3 |
| 1997 [a] | 156.1 | 10.8 | 6.8 | 173.7 |
| 1998 [a] | 163.0 | 12.2 | 7.4 | 182.6 |
| 1999 [a] | 164.0 | 12.7 | 7.6 | 184.3 |
| 2005 [a] | 171.2 | 15.7 | 8.4 | 195.3 |
| 2010 [a] | 176.2 | 18.1 | 8.9 | 203.2 |
| 2015 [a] | 181.5 | 20.5 | 9.5 | 211.5 |
| 2020 [b] | 186.1 | 22.7 | 10.0 | 218.8 |

[a] Source: Federal Aviation Administration, *FAA Aerospace Forecasts, Fiscal Years 2000-2011*, March 2000.

[b] Source: Federal Aviation administration, *FAA Long-Range Aerospace Forecasts, Fiscal Years 2015, 2020 and 2025*, June 2000.

Table 4-2
FAA FORECAST OF ACTIVE PILOTS IN THE U.S.

| Year | Number of Pilots (Thousands) | | |
|----------|------------------------------|-------------------------|--------------|
| | Student Pilots | | Total Pilots |
| | Number | Annual Percent Increase | |
| 1994 [a] | 96.3 | -- | 654.1 |
| 1995 [a] | 101.3 | -- | 639.2 |
| 1996 [a] | 94.9 | -- | 622.3 |
| 1997 [a] | 96.1 | -- | 616.3 |
| 1998 [a] | 97.7 | -- | 618.3 |
| 1999 [a] | 102.0 | -- | 640.1 |
| 2005 [a] | 128.3 | 3.9% | 737.3 |
| 2010 [a] | 148.8 | 3.0% | 810.0 |
| 2015 [b] | [c] | [c] | 881.2 |
| 2020 [b] | [c] | [c] | 949.0 |

[a] Source: Federal Aviation Administration, *FAA Aerospace Forecasts, Fiscal Years 2000-2011*, March 2000.

[b] Source: Federal Aviation Administration, *FAA Long-Range Aerospace Forecasts, Fiscal Years 2015, 2020 and 2025*, June 2000.

[c] Data not available.

COCHISE COLLEGE AIRPORT SERVICE AREA

There are three other public-use airports in the Cochise College Airport service area: Bisbee Douglas International (eight miles northeast), Douglas Municipal (11 miles southeast) and Bisbee Municipal (11 miles west) as seen in Figure 3-1. Cochise College Airport accounts for about 18 percent of the based aircraft and 61 percent of aircraft operations at the four public-use airports in the service area.

LOCAL TRENDS IN AVIATION GROWTH AND FORECAST APPROACH

The State of Arizona forecasts that the number of aircraft based at the four airports (Cochise College Airport, Bisbee Douglas International, Bisbee Municipal and Douglas Municipal) in the Cochise College Airport service area will increase from 84 in 1998 to 98 in 2020. Aircraft operations in the service area during this period are expected to grow from 90,200 in 1998 to 101,500 in 2020 (Table 4-3).

Because the projected increases in based aircraft and operations in the service area are modest, Bisbee Douglas International, Bisbee Municipal and Douglas Municipal together have sufficient capacity to accommodate this growth. Although Cochise College Airport is open to the public, it has no FBO services since it is operated primarily for the purpose of supporting the College's Aviation Program. For these reasons, it is estimated that the increase in general aviation based aircraft and operations in the service area, not supporting the College's Aviation Program, will occur at the other three airports. The demand for based aircraft and operations at Cochise College Airport are projected on the basis of the Aviation Program needs envisioned by the College.

Table 4-3
BASED AIRCRAFT AND OPERATIONS FORECASTS
FOR THE COCHISE COLLEGE AIRPORT SERVICE AREA

| Aircraft Type | Based Aircraft in the Service Area [a] | | | |
|-----------------------------|--|---------------|---------------|----------------|
| | Actual | Forecast | | |
| | 1998 | 2005 | 2010 | 2020 |
| Single Engine Piston | 71 | 75 | 78 | 85 |
| Multi Engine | 9 | 9 | 9 | 9 |
| Other | 4 | 4 | 4 | 4 |
| Total Based Aircraft | 84 | 88 | 91 | 98 |
| Total Operations | 90,200 | 92,700 | 95,500 | 101,500 |

[a] Source: Arizona Department of Transportation, Aeronautics Division, Arizona State Aviation Needs Study (SANS) 2000, Draft Interim Report, August 1999. Based aircraft includes aircraft forecasts for the four public use airports in the Cochise College service area.

FORECAST OF BASED AIRCRAFT

The forecast of based aircraft is used to develop projections of aircraft operations activity, as well as determining facility requirements for airport elements such as aprons and shelters.

The management of Cochise College's aviation program estimates that 20 aircraft will be needed in 2005, three additional single engine airplanes and two additional multi-engine planes (Table 4-4). One of the additional multi-engine aircraft would be used exclusively for A&P training. After 2005, the number of aircraft, by type, is expected to grow at a rate of ten percent every five years (an average of approximately 1.9 percent a year). All aircraft based at the airport will continue to consist of those owned and operated by the College.

The Master Plan forecast of based aircraft in Table 4-4 indicates that the number of flight training aircraft will increase at an average annual rate of 3.6 percent over the same period (from 14 in 2000 to 20 in 2010). This is approximately the same rate of growth as projected by the FAA for student pilots (3.5 percent a year) to 2010. Thus, the based aircraft forecast for the airport's flight training program is consistent with projections by the FAA for student flight training activity, nationwide.

Table 4-4
BASED AIRCRAFT FORECAST
COCHISE COLLEGE AIRPORT

| Aircraft Type | Actual [a] | Forecast [b] | | |
|----------------------|-------------------|---------------------|-------------|-------------|
| | 2000 | 2005 | 2010 | 2020 |
| Single Engine Piston | 14 | 17 | 19 | 23 |
| Multi-Engine Piston | 1 | 3 | 3 | 4 |
| Total | 15 | 20 | 22 | 27 |

[a] Source: Cochise College Aviation Program.

[b] Source: P&D Aviation analysis.

Based on the conditions described above, the total number of aircraft based at the airport is forecast to increase from 15 in 2000 to 27 in 2020. The mix of based aircraft in 2020 is expected to be 23 single engine piston and four multi-engine piston aircraft. There is a potential that the College could operate a turboprop aircraft in the future. Since the acquisition and operation of turboprop aircraft are uncertain, the forecasts do not include turboprop aircraft. All aircraft envisioned in the forecast are in the small airplane category, 12,500 pounds or less maximum gross takeoff weight.

FORECAST OF ANNUAL AIRCRAFT OPERATIONS

Total annual operations were developed for the forecast years based on the forecast of based aircraft, the category of operation, and the type of traffic (local versus itinerant).

The numbers of air taxi and military operations are expected to remain unchanged over the 20-year planning period. General aviation operations are projected to increase in proportion to the increase in numbers of based aircraft. In 1999, there were approximately 3,640 general aviation operations per based aircraft (54,650 / 15). This ratio of operations to based aircraft is projected to continue through 2020. In 1999, about 5.5 percent of general aviation operations were itinerant. This percentage is projected to remain constant through 2020.

The results of the operations forecast are shown in Table 4-5. Total annual aircraft operations at the airport are projected to increase from 55,180 in 1999 to 98,830 by 2020.

Table 4-5
AIRCRAFT OPERATIONS FORECAST
COCHISE COLLEGE AIRPORT

| Type of Operation | Actual [a] | Forecast [b] | | |
|----------------------------|-------------------|---------------------|---------------|---------------|
| | 1999 | 2005 | 2010 | 2020 |
| Air Taxi | 480 | 480 | 480 | 480 |
| General Aviation Local | 51,650 | 68,800 | 75,700 | 92,900 |
| General Aviation Itinerant | 3,000 | 4,000 | 4,400 | 5,400 |
| Military | 50 | 50 | 50 | 50 |
| Total | 55,180 | 73,330 | 80,630 | 98,830 |

[a] Source: Cochise College Aviation Program.

[b] Source: P&D Aviation analysis.

Although there are no instrument approach procedures at the airport, it is estimated that there would be about 500 annual instrument approaches at the airport in 2000 if an instrument approach system were available.

FORECAST OF PEAK HOUR OPERATIONS

The FAA recommends the peak hour operations in the average day of the peak month (ADPM) be projected for master planning purposes. This measure of peak demand is used to compare with runway capacity to identify airfield capacity needs.

Cochise College aviation program management estimates the current ADPM operations are about 180 and peak hour operations in the ADPM are approximately 50. These figures are based on 10 percent of annual operations occurring in the peak month, and average day operations derived by dividing peak month operations by 30.

Forecasts of peak hour operations are based on the percentage of operations in the peak month remaining at ten percent. The percent of ADPM operations in the peak hour is expected to decline over the next 20 years because flight training activity will be spread more evenly throughout the day, declining to 20 percent in 2020. As a result, peak hour operations are projected to increase from approximately 50 today to 66 in 2020 (Table 4-6).

A 1998 ADOT navigational aids study¹ estimated that there was an IFR peak hour demand for three instrument approaches at Cochise College Airport. This demand was projected to 2020 based on a peak hour instrument operations demand of 0.005 percent of annual operations.

Table 4-6
PEAK HOUR AIRCRAFT OPERATIONS FORECAST
COCHISE COLLEGE AIRPORT

| Item | Actual [a] | Forecast [b] | | |
|---|------------|--------------|--------|--------|
| | 1999 | 2005 | 2010 | 2020 |
| Annual Operations | 55,180 | 73,330 | 80,630 | 98,830 |
| Percent of Operations in Peak Month | 10% | 10% | 10% | 10% |
| Operations in Peak Month | 5,520 | 7,330 | 8,060 | 9,880 |
| Operations in Busy Day [c] | 180 | 240 | 270 | 330 |
| Percent of Busy Day Operations in Peak Hour | 28% | 24% | 22% | 20% |
| Operations in Peak Hour of ADPM | 50 | 58 | 60 | 66 |
| IFR Peak Hour Operations [d] | 0 | 2 | 3 | 3 |

[a] Source: Cochise College Aviation Program.

[b] Source: P&D Aviation analysis.

[c] Busy day operations are estimated as the number of peak month operations divided by 30.

[d] Estimated from data contained in Arizona Department of Transportation, Aeronautics Division, Navigational Aids and Aviation Services Special Study, November 1998.

PEAK HOUR GENERAL AVIATION PASSENGERS

About 94 percent of operations at the airport are local training, primarily touch-and-go, operations. With 50 operations in the peak hour, the number of general aviation passengers (pilots plus students) boarding or departing an aircraft is not significant.

¹ Arizona Department of Transportation, Aeronautics Division, Navigational Aids and Aviation Services Special Study, November 1998.

AVIATION FUEL FORECAST**Aviation Gas (Avgas) Forecast**

Avgas flowage is projected using historic ratios of fuel flowage to annual operations. In 1999, an average of 0.58 gallons of 100LL gasoline were pumped per aircraft operation. This average is assumed to continue into the future and is applied to the number of forecast aircraft operations to arrive at the projected avgas flowage (Table 4-7).

Jet-A Fuel Forecast

There is no history of jet fuel usage at the airport. If a turboprop aircraft is operated at the airport, it is estimated the Jet-A fuel consumption would be less than 5,000 gallons a month.

Table 4-7
AVIATION GAS FLOWAGE FORECAST
COCHISE COLLEGE AIRPORT

| Item | Actual [a] | Forecast [b] | | |
|-----------------------|------------|--------------|--------|--------|
| | 1999 | 2005 | 2010 | 2020 |
| Annual Operations | 55,180 | 73,330 | 80,630 | 98,830 |
| Gallons per Operation | 0.58 | 0.58 | 0.58 | 0.58 |
| Fuel Pumped (Gallons) | 32,000 | 43,000 | 47,000 | 57,000 |

[a] Source: Cochise College Aviation Program.

[b] Source: P&D Aviation analysis.

COMPARISON WITH PREVIOUS FORECASTS

The forecasts of total based aircraft and annual aircraft operations developed in this Master Plan are compared with forecasts by others in Table 4-8.

1984 Master Plan Forecasts. The 1984 Master Plan projected 17 based aircraft and 72,914 aircraft operations at the airport in 2003. These projections fall between the present level of activity and the 2000 Master Plan forecasts for 2005.

Cochise County 1994 RASP Forecast. In 1994, Cochise County completed a Regional Aviation System Plan (RASP) for aviation in the County. The 1992 forecasts for Cochise College Airport prepared for that study are between the present level of activity and the 2000 Master Plan forecasts for 2005. The 2012 forecasts are slightly below the 2000 Master Plan forecasts for 2010.

1995 SANS and Draft SANS 2000 Forecasts. The 1995 Arizona State Aviation Needs Study (SANS) assumed based aircraft would remain constant at 23 and operations would remain constant at 59,455 to 2015. The SANS is currently being updated. The Draft SANS 2000 forecasts based aircraft and operations at the airport will be a constant 14 and 45,250, respectively, to 2020. These projections imply that the growth in the Cochise College flight training program envisioned by the College has not been anticipated by ADOT.

Table 4-8
COMPARISON OF BASED AIRCRAFT
AND OPERATIONS FORECASTS
COCHISE COLLEGE AIRPORT

| Item | Actual [a] | Forecast | | | |
|-------------------------------------|---------------|---------------|--------|--------|--------------|
| | 1999/ 2000 | 2002/ 2003 | 2005 | 2010 | 2015 2020 |
| 2000 Master Plan | | | | | |
| Based Aircraft | 15 | | 20 | 22 | 27 |
| Operations | 55,180 | | 73,330 | 80,630 | 98,830 |
| 1984 Master Plan [b] | | | | | |
| Based Aircraft | | 17 | | | |
| Operations | | 72,914 | | | |
| 1994 Cochise County RASP [c] | | | | | |
| Based Aircraft | | 17 | | 19 | |
| Operations | | 63,750 | | 71,250 | |
| 1995 SANS [d] | | | | | |
| Based Aircraft | | | 23 | 23 | 23 |
| Operations | | | 59,455 | 59,455 | 59,455 |
| SANS 2000 [e] | | | | | |
| Based Aircraft | | | 14 | 14 | 14 |
| Operations | | | 45,250 | 45,250 | 45,250 |

[a] Source: Cochise College Aviation Program. Based aircraft in 2000 and operations in 1999.

[b] Source: *Cochise College Airport Master Plan*, Johannessen & Girand Consulting Engineers, Inc., January 1984. Data are for 2003.

[c] Source: Cochise County, *Cochise County Regional Aviation System Plan*, 1994. Data are for 2002 and 2012.

[d] Source: Arizona Department of Transportation, Aeronautics Division, *1995 Arizona State Aviation Needs Study*, November 1995.

[e] Source: Arizona Department of Transportation, Aeronautics Division, *Arizona State Aviation Needs Study 2000*, Draft Interim Report, August 1999.